Reporting Federal Activities . . .

Higher Education

Features for MARCH 1962

Colleges and Universities and Urban Renewal

WILLIAM L. SLAYTON

Earned Degrees in Crucial Manpower Fields

CLARENCE B. LINDQUIST

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education

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The President's Message on Education, February 6, 1962

Excerpts Concerning Higher Education

IN HIS MESSAGE on Education delivered to the Congress, February 6, 1962, the President called again for a general aid bill for the construction of public elementary and secondary classrooms and for raising the level of teachers' salaries. The message also contains recommendations for a 5-year Federal-State program to help States and school districts to improve the education opportunities of migrant workers and their children, for matching grants to the States to assist in the construction of State and other nonprofit educational television stations, for broadening the basic program of aid to handicapped children to include assistance for the special training needed to help all our children afflicted with physical and mental handicaps, and for the establishment of a Federal Advisory Council on the Arts to consider the proper contributions the Federal Government should and can make to the advancement of the arts. In addition to these recommendations, the President requested the enactment of legislation concerning higher education. These recommendations are included here.

Improvement of Educational Quality

Strengthening financial support for education by general Federal aid will not, however, be sufficient. Specific measures directed at selected problems are also needed to improve the quality of education. And the key to educational quality is the teaching profession. About 1 out of every 5 of the nearly 1,600,000 teachers in our elementary and secondary schools fails to meet full certification standards for teaching or has not completed 4 years of college work. Our immediate concern should be to afford them every possible opportunity to improve their professional skills and their command of the subjects they teach.

In all of the principal areas of academic instruction—English, mathematics, physical and biological sciences, foreign languages, history, geography, and the social sciences—significant advances are being made, both in pushing back the frontiers of knowledge and in the methods of transmitting that knowledge. To keep our teachers up to date on such advances, special institutes are offered in some of these areas by many colleges and universities, financed in part by the National Science Foundation and the Office of Education. Many elementary and secondary school teachers would profit from a full year of full-time study in their subject-matter fields. Very few can afford to do so. Yet the benefits of such a year could be shared by outstanding teachers with others in their schools and school systems as well as with countless students. We should begin to make such opportunities available to the elementary and secondary school teachers of this country and thereby accord to this profession the support, prestige, and recognition it deserves.

Another need is for higher standards of teacher education, course content, and instructional methods. The colleges and universities that train our teachers need financial help to examine and further strengthen their programs. Increased research and demonstration efforts must be directed toward improving the learning and teaching of subject matter and developing new and improved learning aids. Excellent but limited work in educational research and development has been undertaken by projects supported by the National Science Foundation, the Office of Education, and private groups. This must be increased—introducing and demonstrating to far more schools than at present up-to-date educational methods using the newest instructional materials and equipment, and providing the most effective inservice training and staff utilization.

Finally, in many urban as well as rural areas of the country, our school systems are confronted with unusually severe educational problems which require the development of new approaches—the problems of gifted children, deprived children, children with

language problems, and children with problems that contribute to the high dropout rate, to name but a few.

To help meet all of these needs for better educational quality and development, and to provide a proper Federal role of assistance and leadership, I recommend that the Congress enact a program designed to help improve the excellence of American education by authorizing—

(1) The award each year of up to 2,500 scholarships to outstanding elementary and secondary school teachers for a year of full-time study;

(2) The establishment of institutes at colleges and universities for elementary and secondary school teachers of those subjects in which improved instruction is needed;

(3) Grants to institutions of higher education to pay part of the cost of special projects designed to strengthen teacher preparation programs through better curriculums and teaching methods;

(4) Amendment of the Cooperative Research Act to permit support of extensive, multipurpose educational research, development, demonstration and evaluation projects; and

(5) Grants for local public school systems to conduct demonstration or experimental projects of limited duration to improve the quality of instruction or meet special educational problems in elementary and secondary schools.

Assistance to Higher Education

In the last 10 days, both Houses of Congress have recognized the importance of higher education to the fulfillment of our national and international responsibilities. Increasing student enrollments in this decade will place a still greater burden on our institutions of higher education than that imposed on our elementary and secondary schools where the cost of education per student is only a fraction as much. Between 1960 and 1970 it is expected that college enrollments will double, and that our total annual operating expenditures for expanding and improving higher education must increase 2½ times, or by nearly $10 billion.

In order to accommodate this increase in enrollments, the Office of Education estimates that nearly $22 billion of college facilities will have to be built during the 1960's—three times the construction achieved in the last 10 years. The extension of the college housing loan program—with a $1.5 billion loan authorization for 5 years, enacted as part of the Housing Act of 1961—assures Federal support for our colleges' urgent residential needs. I am hopeful that the Congress will this month complete its action on legislation to assist in the building of the even more important and urgently needed academic facilities.

But I want to take this opportunity to stress that buildings alone are not enough. In our democracy every young person should have an equal opportunity to obtain a higher education, regardless of his station in life or financial means. Yet more than 400,000 high school seniors who graduated in the upper half of their classes last June failed to enter college this fall. In this group were 200,000 who ranked in the upper 30 percent of their class, of whom one-third to one-half failed to go on to college principally because of a lack of finances. Others lack the necessary guidance, incentive, or the opportunity to attend the college of their choice. But whatever the reason, each of these 400,000 students represents an irreplaceable loss to the Nation.

Student loans have been helpful to many. But they offer neither incentive nor assistance to those students who, by reason of family or other obligations, are unable or unwilling to go deeper into debt. The average cost of higher education today—up nearly 90 percent since 1950 and still rising—is in excess of $1,750 per year per student, or $7,000 for a 4-year course. Industrious students can earn a part of this—they or their families can borrow a part of it—but one-half of all American families had incomes below $5,600 in 1960—and they cannot be expected to borrow, for example, $4,000 for each talented son or daughter that deserves to go to college. Federal scholarships providing up to $1,000 a year can fill part of this gap. It is, moreover, only prudent economic and social policy for the public to share part of the costs of the long period of higher education for those whose development is essential to our national economic and social well-being. All of us share in the benefits—all should share in the costs.

I recommend that the full 5-year assistance to higher education proposal before the Congress, including scholarships for more than 200,000 talented and needy students and cost of education payments to their colleges, be enacted without delay.

Medical and Dental Education

The health needs of our Nation require a sharp expansion of medical and dental education in the United States. We do not have an adequate supply of physicians and dentists today—we are in fact importing many from abroad where they are urgently needed—and the shortage is growing more acute, as the demand for medical services mounts and our population grows. Even to maintain the present ratio of physicians and dentists to population, we must graduate 50 percent more physicians and 90 percent more dentists per year by 1970, requiring not only the expansion of existing schools but the construction of at least 20 new medical schools and 20 new dental schools.

But here again more buildings are not enough. It is an unfortunate and disturbing fact that the high cost of the prolonged education necessary to enter these professions deprives many highly competent young people of an opportunity to serve in these capacities. Over 40 percent of all medical students now come from the 12 percent of our families with incomes of $10,000 or more a year, while only 14 percent of the students come from the 50 percent of the Nation's families with incomes under $5,000. This is unfair and unreasonable. A student's ability—not his parents' income—should determine whether he has the opportunity to enter medicine or dentistry.

I recommend that Congress enact the Health Professions Educational Assistance Act which I proposed last year to (*a*) authorize a 10-year program of matching grants for the construction of new medical and dental schools; and (*b*) provide 4-year scholarships and cost-of-education grants for one-fourth of the entering students in each medical and dental school in the United States.

Scientists and Engineers

Our economic, scientific, and military strength increasingly requires that we have sufficient numbers of scientists and engineers to cope with the fast-changing needs of our time—and the agency with general responsibility for increasing this supply today is the National Science Foundation. At the elementary and secondary school level, I have recommended in the 1963 budget an expansion of the Science Foundation program to develop new instructional materials and laboratory apparatus for use in a larger number of secondary schools and to include additional subjects and age groups; an expansion of the experimental summer program permitting gifted high school students to work with university research scientists; and an expansion in the number of National Science Foundation-supported institutes offering special training in science and mathematics for high school teachers throughout the country. The budget increase requested for this latter program would permit approximately 36,000 high school teachers, representing about 30 percent of the secondary school teachers of science and mathematics in this country, to participate in the program.

At the higher education level, I am recommending similar budget increases for institute programs for college teachers; improvement in the content of college science, mathematics, and engineering courses; funds for laboratory demonstration apparatus; student research programs; additional top-level graduate fellowships in science, mathematics, and engineering; and $61.5 million in grants to our colleges and universities for basic research facilities.

Reduction of Adult Illiteracy

Adult education must be pursued aggressively. Over 8 million American citizens aged 25 or above have attended school for less than 5 years, and more than a third of these completely lack the ability to read and write. The economic result of this lack of schooling is often chronic unemployment, dependency, or delinquency, with all the consequences this entails for these individuals, their families, their communities, and the Nation. The twin tragedies of illiteracy and dependency are often passed on from generation to generation.

There is no need for this. Many nations—including our own—have shown that this problem can be attacked and virtually wiped out. Unfortunately, our State school systems—overburdened in recent years by the increasing demands of growing populations and the increasing handicaps of insufficient revenues—have been unable to give adequate attention to this problem. I recommend the authorization of a 5-year program of grants to institutions of higher learning and to the States, to be coordinated in the development of programs which will offer every adult who is willing and able the opportunity to become literate.

Colleges Universities and Urban Renewal

By WILLIAM L. SLAYTON*

ONE of the most dramatic facts of our time is the rapid, intense urbanization of the United States. The 1960 census showed that 70 percent of the population of the country is in urban areas; only 64 percent was in 1950.

This rapid growth in urbanization has combined with many other factors, some of them the legacy from an unplanned past, to create numerous and baffling problems in our urban areas. Nearly all our urban areas are wrestling with congestion and overcrowding, and problems of housing, health, education, and recreation, and many others. These problems are of vital concern to every citizen, business enterprise, and institution located within urban areas. There are no simple solutions, and various corrective measures are required. Among the measures being tried is the urban renewal program.

The urban renewal program was brought into being by Title I of the Housing Act of 1949. Through this program, financial and technical assistance is provided by the Federal Government to cities that desire and are eligible to participate in it, and the resources of local and Federal Governments are united with private enterprise in mounting an attack on the ills of our cities. This is a local program, locally conceived, locally planned, and locally executed. Under it, 509 cities have already undertaken 914 projects. Four billion dollars in Federal grant authorizations are involved. On the basis of past experience, we expect Federal expenditures in urban renewal to generate a private investment of about $20 billion. A preliminary survey of only the projects which have been approved for execution shows that more than $4 billion in new housing, commercial, industrial, and public construction is already in place or planned. During the next 10 years about 1 million families will have to be moved from project sites, and decent homes will have to be made available to them.

Basically, urban renewal is the machinery with which our urban communities are undertaking comprehensive improvement programs. It is the clearance or rehabilitation of slums or blighted areas and the rehousing of the families displaced, the replanning of these areas so that they may be used in the best interests of the cities, and the demolition of the structures that cannot be retained because of their condition or because of planning considerations. It is the installation of new streets, sewers, water mains, playgrounds, and sidewalks, along with other community utilities and facilities that are necessary to make the area useful for residential, commercial, or business purposes. It is the rehabilitation of structures or the sale of the cleared land to private developers who must agree to build in accordance with the urban renewal plan.

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Thus urban renewal can bring many benefits to the community. Through it, cities can replace bad housing with good housing and bad neighborhoods with better ones, increase tax revenue, lower expenditures for public services, and improve their economic base by creating sites for business and industry. Community facilities may be installed to serve not only project areas but adjacent areas. New schools, parks, streets, and utilities may be built to serve residential, commercial, and industrial districts.

Urban renewal also gives to colleges and universities an opportunity to modernize, upgrade, and expand their campus areas. The pressure not only of present conditions but also of impending expansion makes it imperative that colleges and universities seize this opportunity. On October 1 a feature article entitled "Campus vs. Slums" appeared in the New York Times. The two opening paragraphs of the article read:

> As higher education enrollments grow, the urban universities will play a key role in the expansion. In the total picture of mass education on the college level, the idyllic rural campus will be the privilege of a few; the city campuses will take care of the many community as well as resident students. Like the rest of American life, higher education is being urbanized. Unfortunately, this urbanization coincides with the era of the decay of the American cities.
>
> As the cities fight for renewal, the parallel effort of the universities becomes a major battle both of academic and urban society. For the institutions, it is a two-front war: They must contend with lack of space in a crowded setting; and they must halt the encroachment of slums which turn the lack of space for expansion into a straitjacket of physical danger.

This describes only a part of the sum total of the problems directly facing our educational institutions in urban areas; there are a number of others of vital concern to these institutions. Crime and delinquency in slum areas threaten the well-being of both students and faculty who cannot feel secure in such an atmosphere and may go elsewhere to study or teach. The investment in real estate of institutional facilities is jeopardized, and many are concerned about the wisdom of investing more money in new buildings and campus expansion in such areas.

Colleges and universities have several direct major interests in the urban renewal program:

—As part of the communities in which the daily battle against the effects of slums and blight is being waged.

—As educators of the technicians needed in city planning and in many other phases of urban renewal.

—As employers of faculty members and administrators whose skills, talents, and experience are needed in the program.

—As victims of the unfavorable environment brought on by blight or the rapid urbanization of their environs, by which they are hemmed in and crowded, while at the same time they have difficulty in finding land for expansion.

—As beneficiaries of the special provisions of section 112 of the Housing Act.

Let us now consider these points in more detail.

Direct Participation a Civic Responsibility

The institutions, as corporate members of their communities, can make many direct contributions to urban renewal. Some are located in deteriorating or deteriorated neighborhoods; others, which have previously enjoyed the relative isolation of near-suburban, suburban, or semirural sites, now find themselves being rapidly constricted by new housing developments, commercial expansion, and highway construction. Even though they are directly affected by the adverse atmosphere and environment by which they are surrounded, they have frequently held themselves aloof from involvement in local problems. But the institutions themselves, acting through their trustees, faculties, and business managers, should become active in shaping decisions on these problems.

Responsibility as Educators and Employers

Beyond this direct concern, colleges and universities have the equally important responsibility for training the urban renewal specialists desperately needed by local, State, and Federal agencies engaged in urban renewal activities. Recently, Housing Administrator Robert C. Weaver stated: "As more and more communities expand their efforts in this field, this shortage is going to become increasingly acute. Even today there are some 400 jobs for planners that cannot be filled for lack of trained people. There are corresponding shortages in municipal administration, transportation and traffic engineering, urban economics, State and local finance, and related fields."

Unfortunately, only 30 colleges and universities (3 of them in Canada) are now offering such subjects, as compared, for example, with the greater number offering public administration. The number of

institutions offering these courses is increasing, but not nearly fast enough for the Nation's needs. In 1960, graduates in the needed disciplines numbered 280; in 1961, 360. These figures are far too low.

The program, both locally and nationally, needs men and women from educational institutions to assist in formulating and executing the vast and complex effort to improve our cities. Within the new scope of urban renewal—the many-sided task now visualized for it by the Kennedy administration, the Congress, and the people of the United States—there is not only room but a great need for many professional talents.

Among these talents are included, of course, persons trained in engineering and architecture, but they include as well those trained in the humanities and social sciences. Frankly, however, I am troubled by the fact that professional men, social scientists, for example, have devoted too much of their activity in urban problems to criticism, analysis, and description. These are all valuable to local officials, but they are not nearly as helpful as would be a real effort to devise workable solutions based on realistic assessment of problems.

Why have social scientists been so laggard in joining the many cooperative efforts needed to obtain the full benefits of urban renewal?

I believe that one of the reasons is that so often social scientists work in campus isolation, with rarely an opportunity to test their theories in the world around them. Particularly in housing affairs, they have been able to criticize, point with alarm, deride with scorn, but too often they have not applied their theories to solutions of the problems.

The Democratic administrations of 1932 to 1952 brought with them sweeping new housing and urban redevelopment programs, altogether unknown in our previous history. These programs were brought to fruition 12 years ago with the passage of the great Housing Act of 1949. For the first time, the American people had an opportunity to solve their problems of slum, blight, and unplanned growth—to meet head on the problems that the 20th century can no longer ignore.

Now the urban renewal program is seasoned. We have had our experiences in clearing and redeveloping large tracts of land; we have learned how to rehouse people in a humane manner, how to discharge the manifold responsibilities and duties entrusted to us.

Town and gown have come together in the Kennedy administration. The Administrator of the Housing and Home Finance Agency, Robert C. Weaver, is a nationally recognized social scientist. Our own agency, the Urban Renewal Administration, includes many graduates of the social disciplines: sociologists, social workers, political scientists, public administration specialists, and economists.

Now the time is ripe; the climate for participation by university faculty members in urban renewal was never better. Now for the first time there is a *challenge* to the social scientists to play a positive, productive role and to test the fabric of their theories of housing and related problems against the hard, cold reality of practical living.

Now is the time to end the dichotomy between town and gown in urban renewal matters. Indeed, the ends of both town and gown will be much better served if college and university faculty will descend into the maelstrom of urban life and permit themselves to be caught up in the swirling currents to see whether they have a better method of extrication.

It is, however, out in the cities that help and knowledge at the college and university level are most needed. Urban renewal and other aspects of community development raise serious and fascinating problems which are now being solved by local agencies as best they can with whatever talent they can muster. These problems include the demand for mass urban transportation, more effective local government, rehousing, the mixing of neighborhoods, and economic planning.

Benefits To Be Derived From the Program

Many educational institutions are situated in the very heart of decayed and decaying neighborhoods. This means not only that they are crowded and hemmed in but also that they suffer from the adverse conditions created by blight and slums. It is often impossible to create the type of environment best suited for colleges and universities without planning for renewal of the whole surrounding area. The urban renewal process provides the most expeditious means for clearing unfavorable conditions and at the same time making available land for expansion of campus facilities. Without the various tools of urban renewal—for example, eminent domain, which makes it possible to acquire a large enough area to plan the necessary open spaces, street patterns,

traffic flow, and similar factors—no satisfactory, long-range cure of the ills of a neighborhood is possible. By assisting the municipal planners and other officials in selecting areas for urban renewal treatment and by participating in the formulation of effective steps for bringing about well-conceived projects in these areas, the colleges and universities can render invaluable service.

Colleges and universities are specifically provided for in the urban renewal process. The plight of educational institutions and the decaying neighborhoods in which they were located had been known for many years. In 1957, the chancellor of the University of Chicago, which considered itself among the very worst in this respect, invited the presidents of Harvard, Columbia, the University of Pennsylvania, Yale, and the Massachusetts Institute of Technology to discuss with him possible special Federal aid for educational institutions. As a result of this meeting a survey was made of the neighborhoods surrounding 16 universities from coast to coast. The sad picture this survey presented prompted Congress in 1959 to pass an amendment to the Housing Act of 1949, adding section 112 to title I of that act.

Section 112 recognizes that the location of many universities is not compatible with their needs and functions, and that modernization and expansion of their campuses and facilities present great difficulties. This section permits expenditures by colleges and universities for these specific purposes to be credited toward the local share of the cost of a renewal project: for acquiring properties that are within a quarter-mile of the project and that are to be redeveloped or rehabilitated for educational use in accordance with an approved plan; for demolishing buildings of the property; and for relocating displaced occupants.

By thus encouraging cities to undertake projects in its environs, the university or college gains through the removal of the surrounding blight and through the opportunity to obtain cleared land for expansion. At the same time the community is aided in financing the local share of its urban renewal program.

As of the end of 1961, 41 projects involving credits for expenditures by educational institutions under section 112 had been approved. These institutions included many of the major urban institutions of higher learning in all parts of the country. In the near future a number of other colleges and universities are likely to become involved in projects in their localities.

Actually the role of educational institutions in urban renewal antedates by many years the passage of section 112. Back in 1945 a University of Chicago report concluded that the university had the "worst housed faculty in the U.S." The university took action. In 1952, the 900-acre Hyde Park-Kenwood urban renewal project, which includes the University of Chicago campus, was approved. It is expected that by 1966, after major surgery on the area and the expenditure of $195 million in university, Federal, and local funds, the area will have been made highly suitable for educational and residential use. The project calls for the acquisition of 630 buildings, with a total of almost 6,000 dwelling units and the rehabilitation of hundreds of other buildings.

In New York City, Columbia University is in the midst of the Morningside project and New York University is making progress in the Washington Square area. In Philadelphia, the University of Pennsylvania and Temple University are active participants in projects. In New Haven, a broad-scale urban renewal program, undertaken with the active cooperation of Yale, is making progress toward arresting the spread of blight in the area surrounding the Yale campus. In Providence, R.I., an excellent plan for the private restoration of College Hill will contribute much toward the atmosphere of Brown University and the Rhode Island School of Design, which are on the Hill.

Thus urban renewal is making possible an organized, well-integrated attack on urban problems. Through its financial and other aids, institutions located in urban areas can improve their environment and regain pleasant, suitable atmosphere for their institutions. Now there is hope they can acquire the land they need for expanding their structures and campuses.

It is incumbent on these institutions to lend their assistance to those who are carrying on the operations. By giving their support to the municipal officials and public-spirited citizens who are engaged in selecting areas which need renewal action and by encouraging and giving technical assistance to those who are carrying out programs, they can do much toward making urban renewal succeed.

Colleges and universities have too much at stake to do otherwise.

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Earned Degrees in Crucial Manpower Fields

By CLARENCE B. LINDQUIST*

THE EXTENT of the commitment of the Soviet Union to the production of scientists, engineers, and technicians has been carefully documented in a voluminous and extremely important study, *Education and Professional Employment in the U.S.S.R.*, prepared by Nicholas De Witt of Harvard and recently published by the National Science Foundation. The facts Mr. De Witt sets forth are sobering. He reports, for example, that in the Soviet Union about 57 percent of the bachelor's degrees earned in 1959 were in engineering, science, and applied science fields, as compared with about 24 percent in the United States, and that the Soviets are graduating two or even three times as many people in these fields as we are.

At his news conference on January 15, President Kennedy referred to the De Witt study and expressed concern that the number of our graduates in the sciences and engineering has fallen short of our needs. He said:

"This has been a matter of some concern to me for some time because one of the most critical problems facing this Nation is the inadequacy of the supply of scientific and technical manpower to satisfy the expanding requirements of this country's research and development efforts in the near future." He then stated that he had asked his Science Advisory Committee, in cooperation with the Federal Council for Science and Technology, to review available studies and other pertinent information and to report to him as quickly as possible on the specific measures that can be taken on this matter both in and out of the Government.

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One of the basic facts confronting the Committee and the Council is that, although our population during the 1950's increased substantially and the demands of our growing technology became more pressing, the number of students earning degrees in scientific and technical fields fell far short of the demand. This article, based on the annual *Earned Degrees Conferred: Bachelor's and Higher Degrees* reports of the Office of Education, presents facts and comparisons for the 11-year period, 1949–50 through 1959–60, in the biological sciences, the physical sciences, mathematics and statistics, and engineering.

Major trends.—After a sharp decline during the first half of the 1950's, the number and percentage of bachelor's and master's degrees in biological and physical sciences, mathematics and statistics, and engineering gradually but steadily increased. At the same time the number of doctoral degrees increased steadily throughout the decade, with only a slight decrease in the percentage during the mid-fifties.

The numbers and percentages of degrees for all of these fields by years from 1949–50 through 1959–60 are shown in table 1.

Bachelor's degrees.—As shown in table 1, the 83,108 bachelor's degrees awarded in science, mathematics, and engineering in 1959–60 were still considerably less than the high figure of 101,298 in 1949–50. The 1959–60 figures for the biological sciences, physical sciences, and engineering, considered separately, were substantially below those for 1949–50. Only the mathematical subjects (mathematics, statistics, and actuarial science) showed an increase. In fact, in recent years the mathematical subjects have been the most rapidly growing field among the major disciplines.

The decline in the number of bachelor's degrees earned in science, mathematics, and engineering during the first half of the 1950's was brought about by more than one factor. First, the decline was part of a general decline in degrees earned in all subject fields, the result of the low birth rates of the 1930's, which reduced the number of college-age youth in the early 1950's. Second, the "veterans' bulge" from World War II reached its peak in graduations in 1949–50 and then began to taper off. Just at this time the Korean conflict took some young men who would normally have been in college. Finally, the decreasing popularity of the sciences, mathematics, and engineering during the first half of the fifties contributed to the reduced number of baccalaureates in these fields.

In the case of engineering, reports circulated about 1950 that there was an oversupply of engineers were undoubtedly an important factor in the sharp decrease in the number of engineering baccalaureates—from 52,732 in 1949–50 to 22,236 in 1953–54. By 1958–59 the number had risen again, but only to 38,134, and then decreased in 1959–60 to 37,808.

Master's and doctor's degrees.—Although bachelor's degrees failed to return to their former levels, some comfort may be found in the record during this period of master's and particularly doctor's degrees. The number of these degrees in 1959–60, with the exception of master's degrees in the biological sciences, in every instance exceeded the corresponding number in 1949–50. Mathematics and engineering, indeed, not only showed substantial gains in total numbers of master's and doctor's degrees but also advanced significantly in their percentages at both these levels.

Totals for the 11-year period.—To eliminate year-by-year fluctuations, I have computed totals of degrees conferred in the biological sciences, the physical sciences, mathematics and statistics, and engineering at each level for the 11-year period. (See table 2.) At the bachelor's and master's levels engineering accounted for a little less than half of the total number of degrees in science, mathematics, and engineering; at the doctoral level the physical sciences accounted for nearly half of all the doctorates conferred in these fields, primarily because of the large number of doctorates awarded each year in chemistry.

Degrees awarded to women.—In discussions of means by which our scientific manpower resources might be enlarged, attention has been devoted in recent years to the problem of attracting more women into scientific and technological careers (see table 2). Although women received nearly 1 out of 3 bachelor's degrees in all fields, they received only slightly more than 1 out of 10 of the degrees in science, mathematics, and engineering. At the master's level the corresponding figures were about 1 out of 3 versus about 1 out of 12, and at the doctoral level about 1 out of 10 versus about 1 out of 20. The biological subjects at all levels and mathematics at the bachelor's and master's levels were the most popular fields among women.

The biological sciences.—It will be noted in chart 1 that while biology, general, predominated at the baccalaureate level, the number and percentage of degrees in the various biological specializations increased at each higher level.

The 5 institutions which led the way in production of doctorates in the biological sciences for the 10-year period 1949–50 through 1958–59 were: University of California (all campuses), 960; University of Wisconsin, 720; Cornell University, 456; University of Michigan, 390; and University of Illinois, 344.

The physical sciences.—At the bachelor's level chemistry accounted for nearly half of all physical

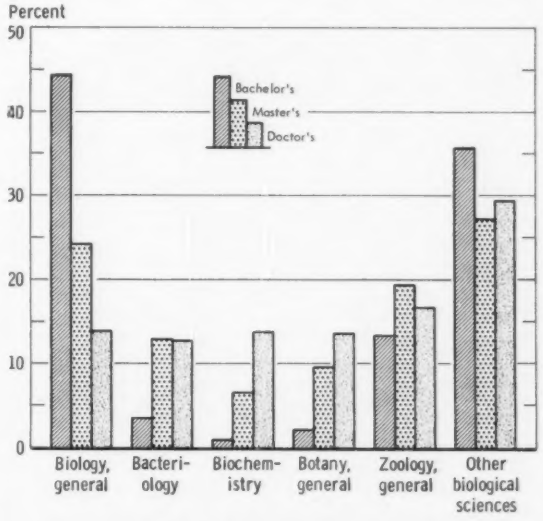


Chart 1.—Degrees awarded in selected biological sciences as percentages of the total of all degrees in the biological sciences, by level, 1949–50 through 1959–60.

Table 1.—Earned degrees conferred in the biological and physical sciences, mathematical subjects, and engineering, by level of degrees: annually, 1949–50 through 1959–60

Year ending June 30—	Number of degrees conferred					Percent of all degrees conferred at each level [1]				
	Total	Biological sciences [2]	Physical sciences [3]	Mathematical subjects [4]	Engineering	Total [5]	Biological sciences [2]	Physical sciences [3]	Mathematical subjects [4]	Engineering
	Bachelor's degrees									
1950	101,298	22,521	19,653	6,392	52,732	23.4	5.2	4.5	1.5	12.2
1951	82,417	18,868	15,903	5,753	41,893	21.4	4.9	4.1	1.5	10.9
1952	63,265	15,423	12,835	4,721	30,286	19.1	4.7	3.9	1.4	9.1
1953	53,994	14,068	11,366	4,396	24,164	17.7	4.6	3.7	1.4	7.9
1954	50,905	13,580	10,993	4,096	22,236	17.4	4.6	3.8	1.4	7.6
1955	50,672	12,847	11,202	4,034	22,589	17.6	4.5	3.9	1.4	7.9
1956	56,411	13,169	12,276	4,660	26,306	18.1	4.2	3.9	1.5	8.5
1957	64,975	14,576	13,642	5,546	31,211	19.1	4.3	4.0	1.6	9.2
1958	72,908	15,354	15,298	6,924	35,332	19.9	4.2	4.2	1.9	9.7
1959	79,707	16,122	16,432	9,019	38,134	20.7	4.2	4.3	2.3	9.9
1960	83,108	16,730	17,133	11,437	37,808	21.0	4.2	4.3	2.9	9.6
	Master's and other 2d-level degrees									
1950	11,595	2,412	3,305	974	4,904	19.9	4.1	5.7	1.7	8.4
1951	12,185	2,603	3,317	1,109	5,156	18.7	4.0	5.1	1.7	7.9
1952	10,466	2,442	3,081	802	4,141	16.5	3.8	4.9	1.3	6.5
1953	9,103	1,994	2,689	677	3,743	14.9	3.3	4.4	1.1	6.1
1954	8,962	1,658	2,421	706	4,177	15.8	2.9	4.3	1.2	7.4
1955	9,515	1,668	2,602	761	4,484	16.4	2.9	4.5	1.3	7.7
1956	10,099	1,789	2,688	898	4,724	17.0	3.0	4.5	1.5	8.0
1957	10,798	1,849	2,752	965	5,232	17.4	3.0	4.4	1.6	8.5
1958	12,131	1,964	3,145	1,234	5,788	18.5	3.0	4.8	1.9	8.8
1959	13,785	2,177	3,356	1,499	6,753	19.8	3.1	4.8	2.2	9.7
1960	14,859	2,351	3,584	1,765	7,159	19.9	3.2	4.8	2.4	9.6
	Doctor's degrees									
1950	2,771	644	1,473	160	494	41.8	9.7	22.2	2.4	7.4
1951	3,217	795	1,652	184	586	43.8	10.8	22.5	2.5	8.0
1952	3,232	770	1,670	206	586	42.1	10.0	21.7	2.7	7.6
1953	3,460	968	1,659	241	592	41.6	11.7	20.0	2.9	7.1
1954	3,616	1,095	1,704	227	590	40.2	12.2	18.9	2.5	6.6
1955	3,560	996	1,715	250	599	40.3	11.3	19.4	2.8	6.8
1956	3,537	1,025	1,667	235	610	39.7	11.5	18.7	2.6	6.9
1957	3,627	1,106	1,676	249	596	41.4	12.6	19.1	2.8	6.8
1958	3,674	1,125	1,655	247	647	41.1	12.6	18.5	2.8	7.2
1959	3,859	1,048	1,815	282	714	41.2	11.2	19.4	3.0	7.6
1960	4,134	1,206	1,839	303	786	42.1	12.3	18.7	3.1	8.0

[1] For example, at the bachelor's level the percentage is based upon the total number of bachelor's and 1st professional degrees conferred that year. A double major with approximately equal concentrations in 2 disciplines is counted as ½ for each discipline.

[2] Includes premedical, predental, and preveterinary sciences; biology, general; botany, general; anatomy and histology; bacteriology, virology, mycology, parasitology; biochemistry; biophysics; entomology; genetics (including experimental plant and

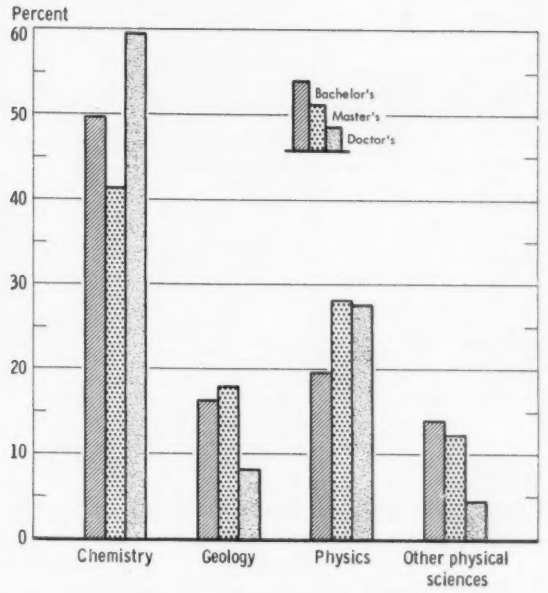


Chart 2.—Degrees awarded in selected physical sciences as percentages of the total of all degrees in the physical sciences, by level, 1949–50 through 1959–60.

science degrees, at the doctoral level for almost 60 percent (see chart 2). Only in physics, a growing field, did the numbers of degrees in 1959–60 exceed at each level the corresponding numbers for 1949–50. Chemistry declined at both the bachelor's and the master's level, but held steady at the doctoral level. After a steady increase in the later fifties, the number of degrees in geology in 1959–60 declined at both the bachelor's and the master's level.

The 5 leading producers of doctorates in the physical sciences for the 10-year period 1949–50 through 1958–59 were: University of California (all campuses), 1,085; Massachusetts Institute of Technology, 819; University of Illinois, 807; Columbia University, 598; and University of Wisconsin, 574.

Engineering.—Although mechanical engineering achieved the greatest number of bachelor's degrees for the entire period and led in the number of first-level engineering degrees for each year from 1949–50 through 1955–56, it ranked second to electrical engineering for each year from 1956–57 through 1959–60. (See chart 3.) At the doctoral level, chemical engineering was the largest field in most years, as well as for the 11-year period taken as a whole, with electrical engineering a close second.

The 5 leading producers of doctorates in engineering for the 10-year period 1949–50 through 1958–59 were: Massachusetts Institute of Technology, 686; University of Illinois, 362; University of Michigan,

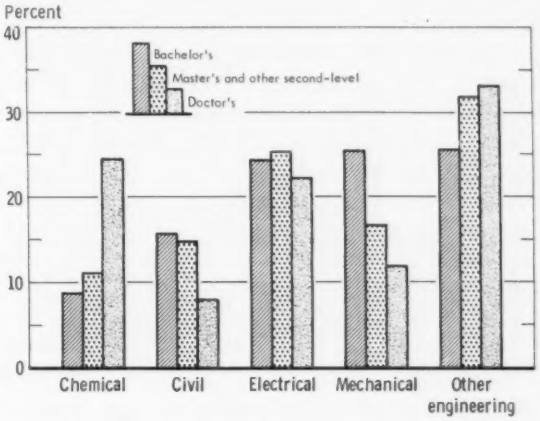


Chart 3.—Degrees awarded in selected specializations in engineering as percentages of the total of all degrees in engineering, by level, 1949–50 through 1959–60.

328; Purdue University, 324; Stanford University, 243.

Mathematics and statistics.—During the past several years, mathematics has experienced a remarkable growth at the bachelor's and master's levels. The annual numbers of formal degrees in statistics,

Continued on page 16

animal breeding); optometry (preprofessional bachelor's degree); pathology (including plant pathology); physiology (including plant physiology); and pharmacology (excluding pharmacy); excludes forestry and agricultural sciences; includes allocations from sciences, general program (without major field).

[3] Includes astronomy; chemistry (excluding biochemistry); metallurgy (beginning with the year 1953–54); meteorology; physics; geology; geophysics; oceanography; earth sciences, other; physical sciences, general major; includes allocations from sciences, general program (without major field).

[4] Includes mathematics, statistics, and actuarial science.

[5] Total does not necessarily equal the sum of components due to rounding.

Source: Earned Degrees Conferred, and Engineering Enrollments and Degrees, Office of Education, U.S. Department of Health, Education, and Welfare. Based upon revised and reallocated data. Data are for aggregate United States.

Reorganization of the Office of Education

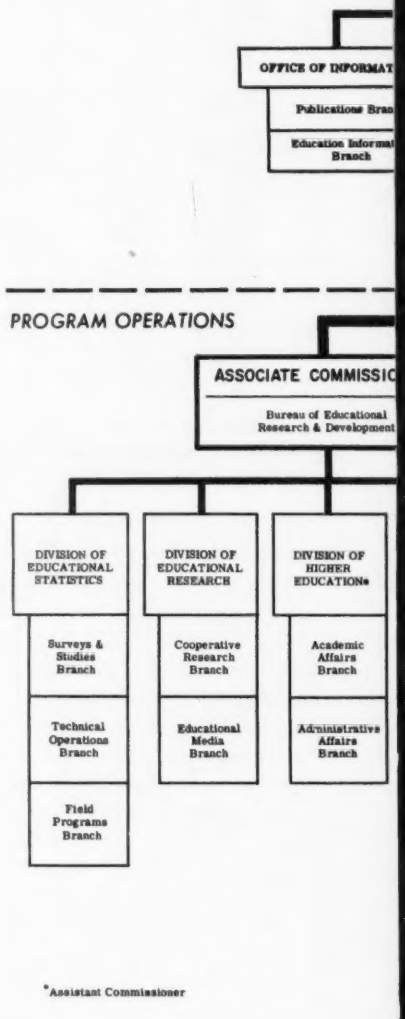
REORGANIZATION of the Office of Education, announced at the end of February by U.S. Commissioner of Education Sterling M. McMurrin, has placed the Division of Higher Education in a newly formed Bureau of Research and Development. The Division, one of five divisions in that bureau, will be composed of two branches—Academic Affairs and Administrative Affairs. These were formerly called the Programs Branch and the College and University Administration Branch. The Financial Aid Branch, which administers the four National Defense Education Act (NDEA) programs in higher education and which formerly was in the Division of Higher Education, will be known as the Division of Institutional Grants and will be placed in the Bureau of Educational Assistance Programs.

A third bureau—the Bureau of International Education—has also been established. It will administer the same programs previously administered in the Division of International Education and will include international education studies and technical assistance and teacher exchange. Each of the three bureaus is to be headed by an associate commissioner. The appointments will be announced in April.

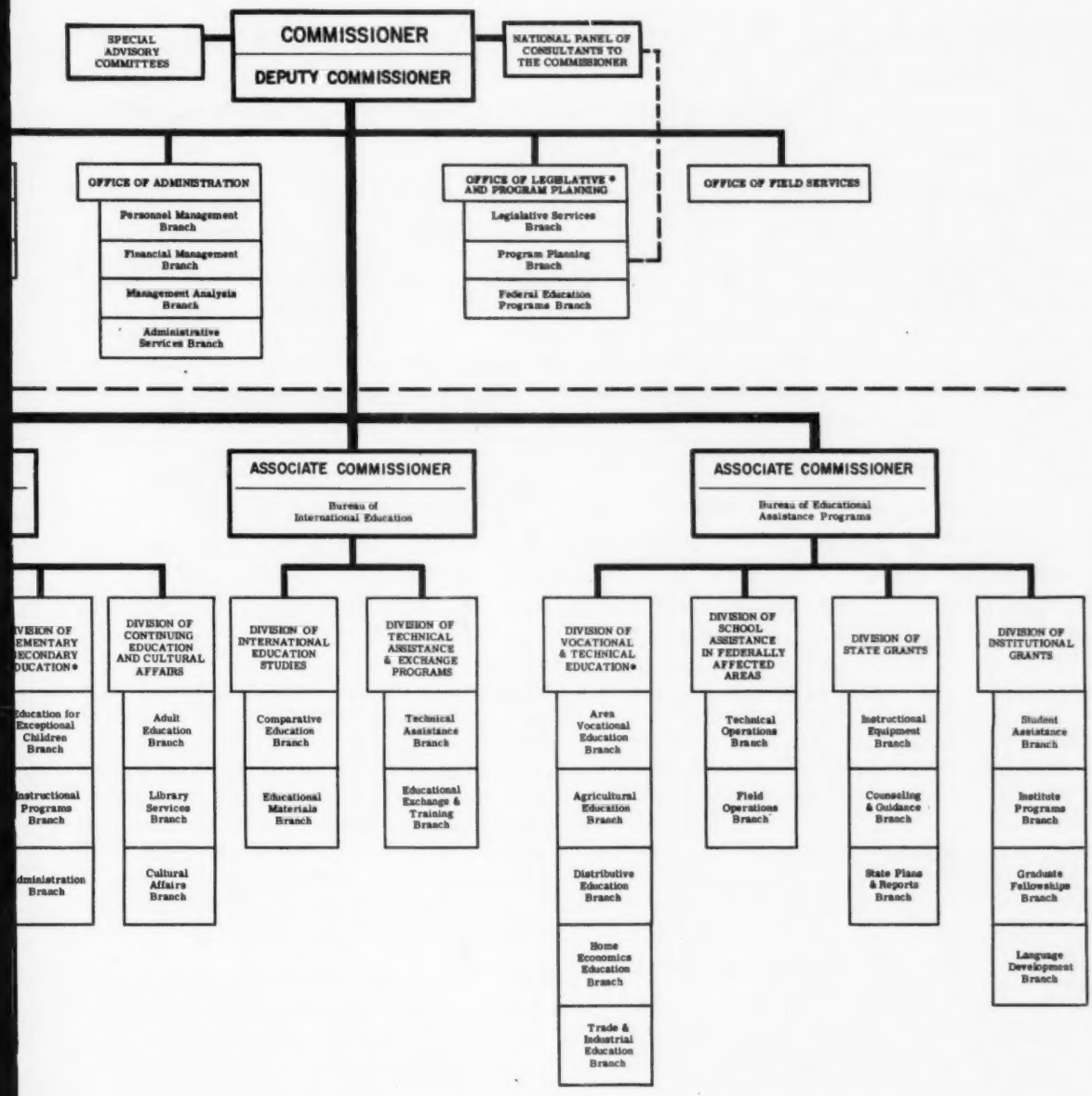
The Bureau of Educational Research and Development combines the previous Division of Statistics and Research Services with the professional research and development activities which previously were carried on in the Divisions of Higher Education and State and Local School Systems. The bureau comprises five divisions: Educational Statistics, Educational Research (Cooperative Research and NDEA Educational Media), Higher Education, Elementary and Secondary Education, and Continuing Education and Cultural Affairs. The last of these includes branches for adult education, library services, and cultural affairs. The third branch is completely new and will be staffed in the near future.

The Bureau of Educational Assistance brings together programs concerned with or based on financial assistance at all educational levels, including Vocational and Technical Education, School Assistance in Federally Affected Areas, State Grants (titles III and V–A of NDEA) and Institutional Grants (titles II, IV, V–B, and VI of NDEA).

Four service areas continue to report directly to the Commissioner: the Office of Information, the Office of Administration, the Office of Legislative and Program Planning, and the Office of Field Services. One of the functions of the Office of Legislative and Program Planning will be to survey the effect of the various governmental programs on all levels of education; and a new branch will be established to perform that function. The Office of the Commissioner also includes a National Panel of Consultants. The panel will be composed of persons of the highest competence in various fields of importance to education; members will be available for consultation individually or in small groups.



These and other changes, Commissioner McMurrin said, have been made necessary by the new developments in



cation in recent years and by the eased responsibilities in the Office Education. The reorganization will ome effective April 1.

Major advantages of the reorganization are the consolidation of elementary, secondary, and higher education program units within a single bureau, a more effective handling of responsibilities in international education, and increased efficiency by reason of the separation of research and development activities from the administration of financial assistance programs.

Earned Degrees in Crucial Manpower Fields—*Continued from p. 13*

Table 2.—Total numbers of degrees conferred, percentages of all degrees, and percentages of degrees awarded to women for the 11-year period 1949–50 through 1959–60

Field	Number of degrees conferred			These degrees as a percent of all degrees conferred at each level			Percent of these degrees conferred upon women		
	Bachelor's and 1st professional	Master's and other 2d level	Doctor's (Ph. D., Ed. D., etc.)	Bachelor's and 1st professional	Master's and other 2d level	Doctor's (Ph. D., Ed. D., etc.)	Bachelor's and 1st professional	Master's and other 2d level	Doctor's (Ph. D., Ed. D. etc.)
All disciplines	3,832,581	693,845	93,589	100.0	100.0	100.0	32.6	31.9	9.9
All science, mathematics, and engineering	759,660	123,498	38,687	19.8	17.8	41.3	10.3	8.0	5.3
Biological sciences [1]	173,258	22,907	10,778	4.5	3.3	11.5	22.4	20.4	11.0
Physical sciences [2]	156,733	32,940	18,525	4.1	4.8	19.8	12.3	8.5	3.7
Mathematical subjects [3]	66,978	11,390	2,584	1.8	1.6	2.8	28.4	18.8	5.4
Engineering	362,691	56,261	6,800	9.5	8.1	7.3	.3	.3	.9

[1] See footnote 2, table 1. [2] See footnote 3, table 1. [3] See footnote 4, table 1.

however, although also growing, are still relatively small, averaging in recent years about 67 at the bachelor's level, about 100 at the master's level, and about 32 at the doctoral level. It is true, however, that many degrees in mathematics have concentrations in statistics.

The 5 leading producers of doctorates in mathematics and statistics for the 10-year period 1949–50 through 1958–59 were: University of California (all campuses), 170; New York University, 120; Princeton University, 114; University of Chicago and University of Michigan, 101 each.

THERE is reason for grave concern about the Nation's failure to encourage sufficient young people to seek careers in scientific and technical fields. The record of the 1950's is in itself disturbing, but even more so is the prospect in the current decade. The Bureau of Labor Statistics has recently estimated that the demand for scientists and engineers will increase 85 percent between 1959 and 1970, and for engineers alone it will increase 90 percent. Present trends would indicate that we shall fall far short of meeting this demand.

Great, however, as is our need for more scientists and technicians, the significance of Mr. De Witt's new study of Soviet education may be found less in the fact that the Russians are numerically outproducing the United States in the training of scientists and engineers than in the more disturbing fact that the average quality of their scientifically and technically trained university graduates is on a par with the average quality in the United States.

EDITOR'S NOTE.—*Articles by Dr. Lindquist dealing with specific manpower fields have recently appeared in the following publications*: GeoTimes (*May–June 1961*); American Mathematical Monthly (*August-September 1961*); Physics Today (*January 1962*); AIBS Bulletin (*American Institute of Biological Sciences*) *in collaboration with E. L. Miller* (*February 1962*); Journal of Chemical Education (*March 1962*). *An article on degrees conferred upon women in the sciences, mathematics, and engineering is appearing in the* AAUW Journal (*American Association of University Women*) *in the March 1962 issue.*

Report of the House Advisory Group on Higher Education

IN A FINAL REPORT to the House Committee on Education and Labor, the Advisory Group on Higher Education, headed by Congressman John Brademas (Democrat, Indiana), has unanimously recommended congressional action on training of semiprofessional technicians, academic facilities, supply and quality of college teachers, and financial assistance to students.

The Advisory Group was asked by Chairman Adam Clayton Powell (Democrat, New York) of the House committee to conduct a 4-month study and to make recommendations for legislation to meet pressing needs in higher education. Four of the Congressmen composing the Advisory Group visited the Soviet Union in the fall of 1961 to observe Soviet higher education, and in compiling its report the group relied heavily on the views of leading members of the American scientific and university community given at a series of informal discussions held throughout the country.

In addition to Mr. Brademas, the group included Robert N. Giaimo (Democrat, Connecticut), James G. O'Hara (Democrat, Michigan), Albert H. Quie (Republican, Minnesota), and Charles E. Goodell (Republican, New York).

The unanimous recommendations of the Advisory Group include a bill for grants and loans for academic facilities and equipment similar to the college facilities bill (H.R. 8900). A number of other legislative recommendations extend or modify the higher education programs of the National Defense Education Act.

These are the recommendations and findings of the group's report, issued under the title "Congressional Action for Higher Education":

Recommendation 1:

That a program of Federal grants to the States be authorized to stimulate the establishment and expansion of technical institutes for the training of semiprofessional technicians at the college level; and

That the Committee on Education and Labor conduct legislative hearings on this subject at the earliest possible date.

The report notes that because the area vocational programs established under title VIII of NDEA "provide training of less-than-college grade, we feel that they are unsuited to the production of semiprofessional technicians who require training at the college level."

Recommendation 2:

That a 5-year program of $300 million annually be authorized in grants and loans for the construction of classrooms, laboratories, libraries, and other academic facilities by public and other nonprofit institutions of higher education;

That the available funds be allotted to grants and loans in the ratio of 70–30; and

That 50–50 matching of grants be required.

It is pointed out that "the recommended ratio of 70 percent for grants and 30 percent for loans is based on recent surveys of the relative need for each type of financing."

Recommendation 3:

That the National Science Foundation program of grants to colleges and universities for undergraduate science teaching equipment should be expanded more rapidly and appropriations for NSF increased accordingly.

NSF already has a small grant program ($5 million in 1962, $7 million in 1963), but "authorities say that the available funds are seriously inadequate."

Recommendation 4:

That authorization be made under title VI of NDEA to provide Federal grants, to be matched equally by institutions, to colleges and universities for language teaching equipment and that the appropriation authorization for title VI be increased by approximately $5 million for this purpose.

Since such assistance is available to high schools under title III of NDEA, "many high schools are now better equipped to teach languages than are the colleges whose job it is to train language teachers for these high schools."

Recommendation 5:

That the national defense graduate fellowship program be extended for 5 years (to June 30, 1967);

That the number of 3-year fellowships (or their equivalent in 1- or 2-year fellowships) authorized to be awarded annually be increased to 3,500;

That eligibility be extended to "underutilized" as well as "new or expanded" graduate programs;

That the cost-of-education allowance be a flat $2,500 (instead of "up to");

That the Commissioner be given the power to set stipends by regulation, to appoint substitutes when fellows die or resign, and to award 1-year or 2-year fellowships when appropriate;

That special consideration be given to the field of engineering, with support going to master's degree candidates as well as doctoral candidates.

Recommendation 6:

That NDEA Language Institutes program be extended to college teachers and those preparing themselves for college teaching;

That more language fellowships be awarded under title VI of the NDEA, particularly to present and future college teachers;

That the annual appropriation authorization for NDEA, title VI, be increased accordingly.

Recommendation 7:

That provision be made under NDEA for a program (similar to the present NSF science faculty program) of institutes, faculty fellowships, and visiting professorships to increase the effectiveness of college teachers in all fields; and

That matching grants be provided to institutions of higher education for support of similar faculty development programs under institutional auspices.

Recommendation 8:

That the National Defense Student Loan Program under title II of NDEA be extended for a 5-year period through June 30, 1967;

That the annual appropriation authorization for this program be increased from $90 million to $200 million; and

That the ceiling on the annual Federal capital contribution to an institution's loan fund be raised from $250,000 to $750,000, or eliminated entirely.

Recommendation 9:

That an institution of higher education may use up to 15 percent of the annual combined Federal and institutional capital contribution to its NDEA student loan fund to make financial assistance grants of up to $1,000 a year each to promising but exceptionally needy undergraduate students, and that in order to insure that these grants-in-aid are awarded only to students who could not otherwise continue their education, no student shall be eligible to receive such a grant if the income and/or assets of such student and of his family or guardian exceed ceilings to be specified under regulations of the Commissioner of Education.

The report finds: "Many students are helped by NDEA loans, but some able students from exceptionally needy families, particularly girls and especially in families where there are other children who must be supported, are unable to accept the risk and burden of substantial debt in order to continue their education. To meet their expenses these exceptionally needy students require grants-in-aid." The Advisory Group also feels that "a program of grants-in-aid to exceptionally needy students should be made part of the NDEA student loan program. Including the grants in the student loan program would save administrative costs, allow the colleges flexibility in using loans and grants-in-aid in the combinations they deem most appropriate to their students' needs and would avoid any stigma that might attach to a separate scholarship program for the neediest." The group consequently favors "allowing participating institutions to use up to 15 percent of the annual combined Federal and institutional contribution to their loan funds for outright grants to promising and exceptionally needy students."

Recommendation 10A:

That an institution of higher education may cancel a portion of an undergraduate student's loan for any year or years in which his academic achievement is deemed outstanding under criteria established by the institution and approved by the Commissioner of Education, provided that the total of such cancellations in any year does not exceed an amount equal to 10 percent of the annual combined Federal and institutional capital contribution to its NDEA student loan fund.

Recommendation 10B:

That the provision for cancellation of up to 50 percent of a loan for public school teaching be eliminated with respect to all students whose first loan from an NDEA loan fund is received for an academic year beginning after June 30, 1962.

"Forgiving" the loans of all students who enter "shortage" or "public-service" occupations seems neither feasible nor desirable and singling out public school teachers from other needed occupations is difficult to defend logically and may have the harmful effect of reducing the incentive for communities to raise teachers' salaries. Hence the Advisory Group favors a phasing out of the teacher forgiveness provision of the NDEA loan program.

Recommendation 11:

That the provisions of the National Defense Student Loan Program be revised so that all eligible students beyond the bachelor's degree level may borrow up to $2,000 in any one academic year to a total of $8,000, in addition to any borrowing they may have done as undergraduates:

That loans to students beyond the bachelor's level be made repayable in equal annual installments over a 15-year period beginning 3 years after the borrower ceases to be a student.

"Graduate students and professional students beyond the bachelor's level need more money than undergraduates, since their tuition is usually higher and since they are older and more likely to have dependents. Many professional students, especially medical students, have excellent future income prospects and will be able to repay substantial loans without undue hardship if the funds are made available to them and if they are able to spread the payments over a sufficiently long period."

Office of Education Studies and Surveys

Engineering Enrollments and Degrees: 1961

FOR 2 CONSECUTIVE YEARS there has been a decrease in the number of bachelor's and first-professional degrees conferred in engineering in the Nation's institutions of higher education. Office of Education surveys show that these decreases in first-level degrees have followed 4 consecutive years of decline in undergraduate engineering enrollment. There are a number of causative factors in these annual decreases, but the specific causes of the decline have not been identified. In the meantime we must assume that such decreases, coming at a time when there is an acute national need for engineers, are serious setbacks.

Other pertinent facts from the Office of Education's annual surveys of engineering enrollments and degrees show that the number of engineering freshmen has remained at approximately the same level for 3 consecutive years. Freshman engineering enrollment in the fall of 1961 was 67,600, in the fall of 1960 it was also 67,600, and in the fall of 1959 it was 67,700. By contrast, total first-time college

Table 1.—Engineering *enrollment* in higher educational institutions, by level: Aggregate United States, fall 1949 to fall 1961

Fall of—	Total engineering enrollment	1st-year students in engineering	Enrolled for bachelor's or 1st engineering degree	Enrolled for the master's degree [1]	Enrolled for the doctor's degree
1961.....	272,777	67,575	232,104	32,804	7,869
1960.....	271,850	67,556	234,190	31,215	6,445
1959.....	278,348	67,704	242,992	29,713	5,643
1958.....	289,680	70,029	256,779	28,138	4,763
1957.....	297,077	78,757	268,761	24,136	4,180
1956.....	277,052	77,738	251,121	22,529	3,402
1955.....	243,390	72,825	221,448	18,779	3,163
1954.....	214,414	65,505	193,692	17,441	3,281
1953.....	193,333	60,478	171,725	18,607	3,001
1952.....	176,549	51,631	156,080	17,539	2,930
1951.....	165,637	39,571	145,997	16,765	2,875
1950.....	180,262	34,299	161,592	15,869	2,801
1949.....	219,712	41,863	201,927	15,242	2,543

[1] Also includes enrollment for other postgraduate predoctoral degrees.

enrollment in all fields in the fall of 1961 was 1,026,000—up 10.4 percent from the fall of 1960, and up 24.1 percent from the fall of 1959.

Total undergraduate engineering enrollment in the fall of 1961 was 232,100—down 0.9 percent from the fall of 1960, and down 13.6 percent from the alltime peak of 268,800 reached in the fall of 1957. Undergraduate engineering students represented 6.0 percent of all degree-credit students enrolled in institutions of higher education in the fall of 1961. This compares with 6.5 percent in 1960 and 7.1 percent in 1959.

During the 1960–61 academic year, 35,900 bachelor's or first-professional engineering degrees were conferred by institutions of higher education. This number is 5.2 percent below the number reported during 1959–60, and 32.0 percent below the post-World War II peak of 52,700 reported during 1949–50. Data on bachelor's degrees for 1960–61 for all fields are not yet available, but it is expected that they will show an increase over 1959–60.

Graduate enrollments and degrees in engineering are currently at the highest level on record. Enrollment for the master's and other predoctoral degrees in engineering in the fall of 1961 was 32,800, and enrollment for the doctorate in engineering was 7,900—representing increases from the fall of 1960 of 5.1 percent and 22.1 percent, respectively. During 1960–61 there were 8,100 master's and other predoctoral degrees conferred in engineering and 943 doctorates—representing increases from 1959–60 of 13.6 percent and 20.0 percent, respectively. Data on advanced degrees conferred in all fields in 1960–61 are not yet available, but it is expected that increases in graduate degrees in engineering will compare favorably with increases for all fields combined.

Table 2.—Engineering *degrees* conferred by higher educational institutions, by level: Aggregate United States, fall 1948–49 to 1960–61

Year	Total engineering degrees	Bachelor's or 1st engineering degrees	Master's degrees [1]	Doctor's degrees
1960–61	44,939	35,860	8,136	943
1959–60	45,753	37,808	7,159	786
1958–59	45,601	38,134	6,753	714
1957–58	41,767	35,332	5,788	647
1956–57	37,039	31,211	5,232	596
1955–56	31,640	26,306	4,724	610
1954–55	27,672	22,589	4,484	599
1953–54	27,003	22,236	4,177	590
1952–53	28,499	24,164	3,743	592
1951–52	35,013	30,286	4,141	586
1950–51	47,635	41,893	5,156	586
1949–50	58,130	52,732	4,904	494
1948–49	50,415	45,200	4,798	417

[1] Also includes postgraduate predoctoral degrees.

In the near future the Office of Education will publish an analytic report on engineering entitled "Engineering Enrollments and Degrees: 1961." This report will show trend data on enrollments and degrees for each engineering curriculum by level, type of institution and control, and by sex, and will provide current data for each of the 245 institutions which confer engineering degrees.

WAYNE E. TOLLIVER
Higher Education Statistics
Educational Statistics Branch

National Defense Education Act Notes

Institutes Scheduled for Language Teachers

NEARLY 4,500 teachers of modern foreign languages in the elementary and secondary schools will be trained in the newest instructional methods at 85 federally financed institutes next summer and during the 1962–63 academic year.

Eight of the 80 summer institutes will be conducted outside the continental limits of the United States. Instruction will be given by university staff members and by native language teachers.

Four of these eight institutes have been organized as part of the new Latin American Studies Program recently launched by the U.S. Office of Education in

response to President Kennedy's call for an Alliance for Progress. The institutes will be at Río Piedras, P.R. (University of Puerto Rico); Guadalajara, Mexico (University of Arizona); Quito, Ecuador (American Institute for Foreign Trade); Tucumán, Argentina (Texas Technological College).

The other four oversea institutes will be at Tours (University of Oregon) and at Besançon (Emory University), France; at Bad Boll, Germany (Stanford University); and at Moscow, Soviet Union (Indiana University). This is the first year for the institute at Besançon, the second for the institutes at Tours and Moscow, and the third for the institute at Bad Boll.

Teachers attending the oversea institutes must be from secondary schools, except for the institute at Bad Boll which plans to accept a few elementary school teachers. Enrollment will be restricted to teachers who have attended an institute in the summer of 1959, 1960, or 1961, although the institute at Moscow will accept some teachers who have previously attended a regular session institute.

Enrollment of secondary school teachers at the summer institutes will be: 1,557 in Spanish, 1,469 in French, 504 in German, 238 in Russian, 24 in Italian, and 30 in Chinese. Enrollment of elementary school teachers at summer institutes will be 268 in Spanish, 203 in French, 60 in German, and 15 in Chinese.

The academic year institutes will enroll 34 secondary school teachers of German, 33 of Spanish, 30 of Russian, and 12 elementary teachers of Spanish and 10 of German.

Total cost of these institutes is $7,161,097, of which $6,420,657 is for summer institutes and $740,440 is for regular session institutes.

Counseling and Guidance Institutes Announced

PROFESSIONAL TRAINING will be given to 2,600 secondary school counselors and teachers preparing to be counselors at 66 counseling and guidance institutes to be conducted this summer and 21 institutes to be conducted during the 1962–63 academic year.

The summer institutes will enroll 2,000 counselors who have already had considerable counselor preparation: one-third of the institutes will serve the special needs of counselors who have had a year or more of professional training, and the remaining institutes will bring the enrollees up to a full year of counselor preparation.

The University of Toledo will conduct a summer institute at Wiesbaden, Germany, for counselors in oversea dependents' secondary schools. Most of the students in these schools are preparing to attend U.S. colleges and universities and consequently are in need of effective counseling and guidance services.

The 600 counselors and teachers to attend the regular session institutes will have had little or no counselor preparation. Since all will enroll in the institutes for the full academic year, the institute training will qualify them for high school counseling positions.

The summer institutes will cost $2.6 million and the regular session institutes $4.4 million. About 60 percent of these funds will be for stipends and dependency allowances, and the remainder for full operational costs of the institutes.

Enrollments at the 1962 summer and regular session institutes will bring the total number trained since the program began to approximately 11,600.

1,500 Graduate Fellowships Allocated

COMMISSIONER MCMURRIN has allocated 1,500 graduate fellowships to 571 graduate programs at 157 graduate schools for the 1962–63 academic year. The fellowships will be awarded to graduate programs around April 15 after institutions have submitted to the Commissioner nominations for fellowships. All but 150 of the fellowships will be for 3 years of study.

Of the 571 graduate programs to be supported, 398 were supported in past years and are now being allocated additional fellowships. The remaining 173 programs are being supported for the first time.

The programs were reviewed by a 12-member advisory committee composed of college presidents and deans, and by 11 consultants representing various academic disciplines. The advisory committee and consultants recommended the approved programs from among 1,120 proposals submitted by 173 graduate schools. The proposals requested a total of 5,621 fellowships.

Graduate schools in every State, except Alaska, and in the District of Columbia are participating in the program. Alaska has doctoral programs but did not submit a proposal.

The new and expanded graduate programs which

have been approved are distributed among six fields: humanities, 21.1 percent; education, 9.6 percent; social sciences, 24.8 percent; biological sciences, 16.0 percent; physical sciences and mathematics, 17.0 percent; and engineering, 11.5 percent.

These fellowships will bring to 5,500 the total number awarded since the program began in 1959–60. The 1,000 fellows who began study in 1959–60 will complete their tenure this June, leaving 4,500 fellowships to be supported in the 1962–63 academic year.

Fellows receive stipends of $2,000 in the first year, $2,200 in the second, and $2,400 in the third, plus an allowance of $400 each year for each dependent. The graduate school receives a grant of up to $2,500 for each fellow enrolled. Thus far about $18 million has been paid to graduate schools to cover the cost of the new or the expansion of the existing programs. In 1962–63 another $11 million will be paid.

Institutions Report Loan Activity, 1960–61

THE NATIONAL Defense Student Loan Program enabled 151,115 students to borrow $70.9 million to help finance their college education during the 1960–61 academic year. Of these 151,115 student borrowers, 137,537 were undergraduate and 13,578 were graduate students. Men borrowers numbered 95,201 and women borrowers 55,914 or 37 percent.

Sixty-seven percent of these loans were made to students with superior academic background in science, mathematics, engineering, or modern foreign languages, and to students preparing to teach in elementary and secondary schools. The law requires that in reviewing loan applications institutions give special consideration to these students. Student borrowers in science numbered 14,887, in mathematics 4,499, in modern foreign languages 2,312, and in engineering 12,334. Student borrowers preparing to teach totaled 69,552.

Of the 1,410 colleges and universities participating in the program during the 1960–61 academic year, 886 were private and 524 public. The largest number of participating institutions were liberal arts colleges (656), followed by junior colleges (249), teachers colleges (184), universities (153), theological colleges (46), professional colleges (46), technological colleges (33), art and music colleges (27), semiprofessional colleges (9), and technical institutes (7).

As of June 30, 1961, a total of 238,092 students had borrowed $130.6 million since the program began in February 1959. During the same period 12,785 student borrowers had repaid $1.95 million to the loan funds set up at colleges and universities. This represents about eight times the amount actually due, an accelerated rate of payment which is purely voluntary on the part of the student. Borrowers begin repayment 1 year after they complete their college work and may choose to make payments over a 10-year period at 3 percent interest. Repayments of loan principal and interest go back into the loan funds of the colleges and universities and may be used for further loans to students.

In addition to the 12,785 students who have begun repayments, 4,118 have applied for partial cancellation of their loans because of full-time teaching service in a public elementary or secondary school. The law provides for 10 percent cancellation of loan principal for each year of teaching service, up to 50 percent of the total loan principal. As of June 30, 1961, the total amount of student loans canceled was $233,037.

The 1,458 colleges and universities participating in the program in 1961–62 have received $73.8 million in Federal funds, including loan allocations for the current academic year. To this the institutions have added $8.02 million of their own money. The law requires the institution to contribute $1 for every $9 of Federal funds.

Other NDEA Developments

▶ Postdoctoral fellowships in Latin American languages will be awarded for the first time this summer. The fellowships are a further extension of the Latin American Studies Program being administered by the Office of Education under the Language Development Program (title VI). Fifteen fellowships will be awarded for 6 weeks of study of American Spanish at the Latin American Language and Area Center at the University of California, Los Angeles, and 15 for 9 weeks of study of Brazilian Portuguese at the Latin American Language and Area Center at the University of Texas. Applicants must hold a doctoral or equivalent degree and must demonstrate need for language training for either college teaching or an essential professional or technical activity, Government or non-Government (nonprofit, nonsectarian) organization. Applications are submitted

directly to the universities. Stipends include tuition and all required fees, plus $1,000 for the 6-week course at UCLA and $120 for each dependent, and $1,125 for the 9-week course at the University of Texas and $135 for each dependent. The Commissioner of Education will announce the awards on April 15.

▶ Thirteen NDEA Language and Area Centers being supported during the current academic year will receive an additional $80,000 this summer to conduct specially designed intensive language programs. Centers have conducted summer programs with NDEA funds in the past, but this is the first time funds have been set aside solely for intensive language instruction. Twenty-two languages, none of them commonly taught in the United States, will be offered at the centers. Some of the instruction will include area studies, but emphasis will be on the languages. While the courses are generally designed for graduate students, undergraduates and nondegree students may enroll in them. The following summer programs will be supported: Arabic at the University of Texas; Arabic, Persian, and Turkish at Harvard University; Bengali, Urdu, and Tamil at the University of Chicago; Chinese and Japanese at Columbia University; Chinese and Japanese at the University of Michigan; Chinese and Japanese at Stanford University; Hindi at the University of Texas; Hindi, Telegu, and Kannada at the University of Wisconsin; Hindi-Urdu, Nepali, and Marathi at the University of Pennsylvania; Ibo, Yoruba, Swahili, and Hausa at Michigan State University; Indonesian and Thai at Cornell University; Japanese at the University of Kansas; and Polish and Russian at Indiana University.

▶ Reading proficiency tests in French, German, and Russian for graduate students who must meet language requirements for advanced degrees are being developed by Cornell University under contract with the title VI Language Research and Studies Program. From these tests will result a definable standard of proficiency in reading foreign languages which graduate students and language course instructors will be able to use. If adopted by graduate schools, the tests are expected to bring about higher requirements for proficiency in foreign languages. Damon Boynton, dean of the Cornell University Graduate School, will be director of the project. He developed the project at the request of the Association of Graduate Schools, which last year made him chairman of a committee on testing, to seek ways of making the language requirement for the doctoral degree more significant. The project, to cost $78,214, will be completed by May 1, 1964. The tests will be administered to 3,750 graduate students at about 40 graduate schools which have agreed to participate in the project.

Other Program Notes

NSF Releases Report on Education in U.S.S.R.

A MAJOR STUDY of Soviet education has found that the Soviet Union is producing each year two to three times as many graduate scientists and technologists as the United States, a trend that will accelerate during the 1960's.

This 900-page study, *Education and Professional Employment in the U.S.S.R.*, was prepared by Nicholas De Witt, associate of the Russian Research Center at Harvard University and research associate of the Office of Scientific Personnel of the National Academy of Sciences-National Research Council. The publication is the result of a 3-year research project undertaken by Mr. De Witt for the National Science Foundation under a grant administered by the Academy Research Council.

The extent of the Soviet commitment to science and technology, Mr. De Witt points out, is measured by the fact that about 57 percent of all 1959 graduates at the bachelor's degree level were in engineering, the sciences, and selected applied science fields. This compares with 24 percent in these fields in the United States for the same year. Though Soviet professional instruction is extensive in fundamentals of science and engineering, it is directed toward narrowly defined specialties with the main purpose

of equipping the individual student to perform a specific job.

Some of the highlights of Mr. DeWitt's study are quoted here:

*The U.S.S.R. has been operating a much more selective educational system than the United States on all levels beyond the elementary, with a far smaller ratio of students in the respective age groups gaining access to education on the secondary and higher levels.

*Soviet Union wartime population losses led to a 30-percent decline in the number of students aged 8 to 17 in 1959 compared with 1939.

*Educational reforms in the Soviet primary and secondary curricula have increased the time devoted to academic subjects, and have particularly intensified training in vocational-technical subjects. In the standard school curriculum the only option a student may exercise is the selection of one alternative in the fundamentals of production and specific vocational skill training.

*The Soviet Union has no equivalent to the American university liberal arts program.

*In 1959 the total higher education enrollment in the Soviet Union (2.2 million) was about two-thirds the size of resident enrollment in U.S. colleges and universities (3.6 million).

*More than one-half of all Soviet higher education graduates are women who also comprise one-third of all engineering field professionals (as compared with 1 percent in the United States).

*Although the U.S.S.R. has a lead in absolute numbers of graduates in applied fields of engineering and science, the United States graduated many more nonapplied scientists in the physical and biological sciences, 35,700 in 1958 compared to 21,000 in those fields in the U.S.S.R. (1959). U.S. figures included 5,000 to 10,000 prospective teachers, excluded from the Soviet total.

*Nearly one-third of all Soviet engineers, scientists, and agricultural specialists are engaged in administrative tasks and in running the Government, reflecting the Soviet belief that they can perform these tasks better than non-technically-trained professionals.

*The support of education is strong, and upwards of 5 percent of the gross national product is currently spent by the Soviet Union on education (as compared with about 3.6 percent in the United States).

*With only half as many higher education graduates as the United States, the Soviet Union has a greater number of professionals in scientific, engineering, and other applied science fields, and the Soviet rate of growth in these fields is more than twice that of the United States. While we produce about 90,000 engineering, science, and applied science professionals each year, the Soviet Union's production is currently 190,000 annually. Projections indicate that during the decade of the 1960's the Soviet rate will reach 250,000 annually, more than twice the anticipated rate for the United States.

In a postscript to his study, Mr. De Witt has this to say:

"In Soviet higher education, the development of professional competence and technical rationality is divorced, perhaps quite deliberately, from the acquisition of broad humanistic values, a fact which makes the Soviet professional a tool, witting or unwitting, in serving the aims of the Communist regime. Soviet higher education succeeds in developing the human mind to the point of high competence in many areas, but deprives it of its potential to exercise independent and creative thought in the sphere of social values. The social aims and political goals were, and continue to be, shaped by Soviet rulers, who are Communist strategists first and technical specialists second. If the aim of education is to develop a creative intellect critical of society and its values, then Soviet higher education is an obvious failure. If its aim is to develop applied professional skills enabling the individual to perform specialized, functional tasks, then Soviet higher education is unquestionably a success, posing not only a temporary challenge, but a major threat in the long-run struggle between democracy and totalitarianism."

Loan Program for Cuban Students Allocated $500,000

THE U.S. LOAN PROGRAM for Cuban Students being administered by the National Defense Student Loan Program in the Office of Education has been assigned additional funds in the amount of $500,000 to help Cuban student refugees continue their education at U.S. colleges and universities in the spring semester. This brings to $1,115,575 the total Cuban loan funds made available since the program began in February 1961.

Thus far 95 colleges and universities have re-

quested $421,827 for 926 Cuban students for the spring semester. The average loan request per student is $455. Other institutions are expected to apply for the rest of the funds available.

Last fall 133 institutions loaned $362,749 to 850 Cuban students, last summer 57 institutions loaned $149,020 to 472 students, and during the 1961 spring semester 47 institutions loaned $103,806 to 390 students. All of these funds have been made available from the contingency fund of the Mutual Security Act.

The maximum loan per semester is $500. No interest is charged and the repayment period extends over 5 years, beginning 1 year after the student completes full-time study. The student makes loan repayments directly to the U.S. Office of Education. Institutions reporting on the Cuban student loan activity indicate that the Cuban refugee students are using their loans to pay tuition and fees, and to pay off tuition waivers and other extensions of credit which the institution had granted.

College Teachers Needed by the Peace Corps

REQUESTS for volunteers for the Peace Corps have increased sixfold since last March. Over 5,000 volunteers have been requested by 42 countries, to take up teaching positions in a wide range of subjects. In Africa alone the request for teachers in secondary education exceeds 1,000.

Training for the Ghana group of Peace Corps volunteers who qualify as secondary school teachers will be given at the University of California, Berkeley, from July 2 to August 21. Oversea training in Ghana starts August 30; duty begins September 18. Nigeria's volunteers in education will be trained at various universities, including Harvard, University of California, Los Angeles, Michigan State University, and Columbia. Training will begin in the early fall. Applications are being taken now.

Although the greater part of the requests are for teachers in secondary schools, the total includes approximately 270 appeals for college and university teachers. The Philippines and Venezuela have requested approximately 50 each of these, Nigeria 30, and Ceylon and other Southeast Asian countries about 140. Among the fields for which these teachers are needed, English ranks first, followed by the physical and social sciences, physical education, home economics, nursing, and mathematics.

Qualifications for college teaching under the program include a bachelor's or in some cases a master's degree in the field requested, together with some teaching experience or practice teaching, or a degree in education. Graduate teaching assistants are not only eligible to apply but are welcomed. Volunteers must be at least 18 years of age. Married couples are eligible if both qualify and they have no dependents under 18.

Training, to start between now and September, has been scheduled in two phases. The first, conducted at an American college or university, lasts approximately 3 months. Its curriculum covers the culture, people, and policies of the host country as well as U.S. history, international relations, language training, and refresher courses in the skills required. A month's attendance at the Peace Corps Training Center in Puerto Rico may also be added. The second phase of training, conducted by host country teachers, begins almost immediately on arrival overseas and lasts from 2 weeks to 3 months. In their training Volunteers may be required to learn a new language.

The Corps particularly welcomes applications from persons with experience or training in departments of Romance languages, not only for the many teaching projects in Latin America but also because training in a second language is most helpful to those who are going to teach English as a second language, no matter what their host country.

John F. Morse To Head Congressional Study

CONGRESSWOMAN EDITH GREEN (Democrat, Oregon), chairman of the Special Subcommittee on Education of the House Education and Labor Committee, has named John F. Morse director of a study of Federal educational programs. Mr. Morse has been granted leave of absence from his post as vice president of Rensselaer Polytechnic Institute.

The study will include analysis of some 150 education programs now being administered by 9 Federal departments and 7 independent agencies. Total cost of these programs is about $2.5 billion annually. The purpose of the study, Mrs. Green says, is to discover whether there is duplication and overlapping among these Federal programs, to

determine whether the programs are meeting today's needs, and to evaluate the influence of Federal higher education programs on colleges and universities. It is expected that the study will be completed this year and that subcommittee hearings will be held on its findings.

Mr. Morse has been with Rensselaer Polytechnic Institute since 1950, first as dean of admissions and later as vice president. Earlier he had been a teacher at Romford School, Connecticut, and a teacher and assistant headmaster at Taft School, Connecticut. In 1960 he was on leave from RPI to serve as chief of the National Defense student loan program.

National Science Foundation Activities

THIS SUMMER about 20,000 high school and 2,000 college teachers of science, mathematics, and engineering will attend 481 institutes being supported by the National Science Foundation. The 274 colleges and universities to conduct the institutes will receive grants totaling $26.4 million.

The summer institutes, each to enroll about 50 applicants for sessions lasting 6 to 8 weeks, will acquaint the teachers with recent developments and advancements in science, mathematics, and engineering and at the same time give them an opportunity to refresh their knowledge of fundamentals. Emphasis will also be given to familiarizing participants with new techniques in presenting subject matter.

Since NSF's program of Summer Institutes for Science, Mathematics, and Engineering Teachers was established in 1953, 8,374 college teachers have received training at 256 institutes and 64,214 high school teachers have received training at 1,113 institutes. These figures represent about 3 percent of the college teachers in these fields and 17 percent of the high school teachers.

THE ACADEMIC year institute program will begin its seventh year of operation in 1962–63 with places for 1,700 secondary school teachers and 100 college teachers of science and mathematics. Support is also available for about 50 recent college graduates who are certified to teach science and mathematics in secondary school but who have no actual teaching experience. The courses to be provided are for teachers who may have received little formal scientific education beyond that of their undergraduate preparation. Many of the teachers to participate in the institutes will be able to earn a master's degree in science or mathematics or in the teaching of science or mathematics. A maximum stipend of $3,000 for the academic year is provided, plus an additional allowance for dependents at the maximum rate of $450 each up to a total of four dependents. Preservice teachers will receive a maximum stipend of $1,800 for 12 months' participation, plus an additional maximum allowance for dependents of $500 each.

ABOUT $850,000 has been granted to 48 colleges and universities to support research programs in which 350 college teachers of science will participate, and another $735,000 is being granted to 47 colleges and universities for programs for 370 high school teachers. Both programs will enable teachers to help carry out research projects of a university or college department and to work directly with researchers in charge of the projects. Most of the research of the college teachers will be carried on during the summer, although some grants will allow selected teachers to continue their work during the academic year. Stipends and allowances for travel and dependents are provided.

AN OFFICE of International Science Activities has been established by the National Science Foundation. The new Office will provide staff and policy guidance on international aspects of research support, science education, and exchange of scientific information. It will also, at the request or with the concurrence of the Department of State, plan, develop, and administer activities for the formulation of U.S. foreign policy in science and science education, and will cooperate with Federal agencies and international organizations in administering the scientific and technological parts of their programs. The Office will be headed by Arthur Roe, who formerly headed the Foundation's Planning Group for Educational and International Activities, the duties of which have been assigned to other Foundation offices.

ABOUT 700 public and private elementary school staff members will receive supplementary training in science and mathematics through a

program of institutes to be conducted next summer. Grants totaling $711,500 will be made to colleges and universities for 21 institutes to be operated in 18 States. The grants will cover the cost of tuition, fees, stipends, and allowances. Since the program was launched, 46 institutes have been conducted for 1,726 teachers, or about 0.2 percent of the elementary science and mathematics teachers.

New Appointments

Peter P. Muirhead has been named Assistant Commissioner for Legislative and Program Development in the Office of Education.

Prior to assuming his new duties, Mr. Muirhead was Director of the Financial Aid Branch in the Division of Higher Education. Before coming to Washington in December 1959 to head the Student Loan Program, he had served as Director of the New York State Regents Scholarships and Examinations Program and as executive secretary of the New York Higher Education Assistance Program, which provides loans to college students. He received his B. Sc. at State Teachers College, Albany, N.Y., and his M. A. at the University of Rochester.

Under the reorganization plan for the Office of Education, the Legislative and Program Development Branch has become Office of Legislative and Program Planning. The office will have three branches—Legislative Services, Program Planning, and Federal Education Programs.

Kenneth W. Mildenberger has been appointed to succeed Mr. Muirhead as Director of the Financial Aid Branch. In that capacity he will serve as chief administrator of the four NDEA higher education programs. Dr. Mildenberger has been associated with the Language Development Program since September 1958 and became chief of the Language Development Section in November 1959. He has been associate secretary of the Modern Language Association and director of the Association's foreign language program. Dr. Mildenberger taught English at New York University where he received his M. A. and Ph. D. degrees. His B. A. is from Queens College, New York.

Under the reorganization plan the Financial Aid Branch will become the Division of Institutional Grants and be in the Bureau of Educational Assistance Programs.

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(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.*

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From the Office of Education

Factors Related to College Attendance, by Robert H. Beezer and Howard F. Hjelm. Washington, U.S. Government Printing Office, 1961. 42 p. 20 cents. (OE–54023)

Presents selected findings of three statewide surveys conducted in Arkansas, Indiana, and Wisconsin under the sponsorship of the Cooperative Research Program of the Office of Education.

Guidance for the Underachiever with Superior Ability, Leonard M. Miller, *ed.* Washington, U.S. Government Printing Office, 1961. 85 p. 35 cents. (OE–25021)

Based on the work of a conference called by the Office of Education in June 1960, this bulletin contains suggestions on how the guidance needs and problems of underachievers with superior ability can be identified, and defines ways in which these needs can be met at the various educational levels. The chapter devoted to this subject at the college level shows the problem as involving every aspect of campus life, and advocates the development by colleges and universities of strong guidance and student personnel programs.

International Educational Exchange: A Selected Bibliography, prepared by Thomas E. Cotner. Washington, U.S. Government Printing Office, 1961. 117 p. 50 cents. (OE–14066)

Updates and greatly expands 1951 and 1954 editions. Lists available literature, including laws and regulations on international fellowships, scholarships, and exchange of persons programs, as well as on counseling and program planning for exchange visitors from other countries. Also lists reports on exchange programs. A new section on bibliographies in related fields has been added.

Job Motivations and Satisfactions of College Teachers, by Ruth E. Eckert and John E. Stecklein. Washington, U.S. Government Printing Office, 1961. 96 p. 35 cents. (OE–53009)

Reports the findings of a research study conducted in Minnesota among the 32 public and private institutions of higher

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National Defense Graduate Fellowship Program: A Report on the First Two Years, by Robert M. Rosenzweig and Gerald W. Elbers. Washington, U.S. Government Printing Office, 1961. 12 p. 15 cents. (OE–55020)

Reviews the progress of the program, the policies governing it, and its operation during the first 2 years. Includes tables on proposed and approved programs and fellowships requested by type of institution, and shows the distribution of awards by area of study and by State.

National Defense Graduate Fellowships: Graduate Programs 1962–63. U.S. Department of Health, Education, and Welfare, Office of Education, Washington, January 1962. 23 p. (OE–55017–63)

Lists, for use by deans and department heads, graduate programs which have been approved for the award of National Defense Graduate Fellowships in the spring of 1962, together with the names of participating institutions and the number of fellowships allocated to each program.

National Defense Student Loan Program, Including Participating Institutions, 1961–62. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, 1962. 39 p. (OE–55001–62)

Describes the program and lists, State by State, the institutions of higher education taking part in it.

Reporter 4—Clearinghouse of Studies on Higher Education, by Winslow R. Hatch, Alice L. Richards, and Ann Bennet. Washington, U.S. Government Printing Office, 1961. 55 p. 40 cents. (OE–50004–3)

Presents annotated listings of studies on higher education received from institutions and agencies of higher education, cross-indexed under 25 subject categories such as administration, admission, curriculum, facilities, finance, graduate education, self-studies, and surveys.

Summary Report on Bachelor's and Higher Degrees Conferred During the Year 1959–60, by Wayne E. Tolliver. Washington, U.S. Department of Health, Education, and Welfare, Office of Education, 1961. 8 p. (OE–54010–60)

From Other Government Agencies

Academic Year Institutes for Science and Mathematics Teachers 1962–63. Washington, National Science Foundation, 1961. 16 p. See page 26.

Congressional Action for Higher Education: Report of the Advisory Group on Higher Education, 87th Cong., 2d sess., Committee on Education and Labor, House of Representatives. Washington, U.S. Government Printing Office, January 1962. 11 p. See page 17.

Education and Professional Employment in the U.S.S.R., by Nicholas De Witt. Washington, U.S. Government Printing Office, January 1962. 900 p. $5.50. (National Science Foundation, NSF 61–40.) See page 23.

Scientific and Technical Personnel in Industry 1960. Washington, U.S. Government Printing Office, 1961. 58 p. 45 cents. (National Science Foundation, 61–75.)

The final report, including detailed and analyzed statistics, on the employment of scientists, engineers, and technicians by U.S. private industry during 1960. The survey was conducted and the report prepared for the National Science Foundation by the U.S. Department of Labor's Bureau of Labor Statistics.

Specialized Science Information Services in the United States. Washington, U.S. Government Printing Office, 1961. 530 p. $1.75. (National Science Foundation, NSF 61–154.)

A directory of organizations offering science information services. A brief description is given of each center's area of scientific specialization, of the types of information services it provides, and of the publications it issues.

Summer Institutes for Science, Mathematics, and Engineering Teachers: 1962. Washington, National Science Foundation, 1961. 79 p. See page 26.

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